

Serial Number: 10/070,412

CRF Processing Date:

2/18/2002

Edited by:

Verified by:

(STIC staff)

ENTERED

- Changed a file from non-ASCII to ASCII
- Changed the margins in cases where the sequence text was wrapped down to the next line.
- Edited a format error in the Current Application Data section, specifically: _____
- Edited the Current Application Data section with the actual current number. The number inputted by the applicant was the prior application data; or other _____
- Added the mandatory heading and subheadings for "Current Application Data".
- Edited the "Number of Sequences" field. The applicant spelled out a number instead of using an integer.
- Changed the spelling of a mandatory field (the headings or subheadings), specifically: _____
- Corrected the SEQ ID NO when obviously incorrect. The sequence numbers that were edited were: _____
- Inserted or corrected a nucleic number at the end of a nucleic line. SEQ ID NO's edited: _____
- Corrected subheading placement. All responses must be on the same line as each subheading. If the applicant placed a response below the subheading, this was moved to its appropriate place.
- Inserted colons after headings/subheadings. Headings edited included: _____
- Deleted extra, invalid, headings used by an applicant, specifically: _____
- Deleted: non-ASCII "garbage" at the beginning/end of files; secretary initials/filename at end of file; page numbers throughout text; other invalid text, such as _____
- Inserted mandatory headings, specifically: C2207 Seq.2
- Corrected an obvious error in the response, specifically: _____
- Edited identifiers where upper case is used but lower case is required, or vice versa.
- Corrected an error in the Number of Sequences field, specifically: _____
- A "Hard Page Break" code was inserted by the applicant. All occurrences had to be deleted.
- Deleted **ending** stop codon in amino acid sequences and adjusted the "(A)Length:" field accordingly (error due to a PatentIn bug). Sequences corrected: _____
- Other: _____

*Examiner: The above corrections must be communicated to the applicant in the first Office Action. DO NOT send a copy of this form.

3/1/95



PCT10

RAW SEQUENCE LISTING DATE: 07/18/2002
PATENT APPLICATION: US/10/070,412 TIME: 21:58:57

Input Set : N:\Crf3\07152002\J070412.raw
Output Set: N:\CRF3\07182002\J070412.raw

1 <110> APPLICANT: AstaCarotene AB
2 <120> TITLE OF INVENTION: DNA construct and its use
3 <130> FILE REFERENCE: 29295-AstaCarotene
4 <140> CURRENT APPLICATION NUMBER: US/10/070,412
5 <141> CURRENT FILING DATE: 2002-06-12
6 <160> NUMBER OF SEQ ID NOS: 2
7 <170> SOFTWARE: PatentIn Ver. 2.1
8 <210> SEQ ID NO: 1
10 <211> LENGTH: 2543
11 <212> TYPE: DNA
12 <213> ORGANISM: Artificial Sequence
13 <220> FEATURE:
14 <223> OTHER INFORMATION: Description of Artificial Sequence: napin promoter
15 + chloroplast localization signal + beta-carotene C-4 oxygenase
16 coding sequence + termination sequence
17 <220> FEATURE:
18 <221> NAME/KEY: promoter
19 <222> LOCATION: (1)..(1145)
20 <220> FEATURE:
21 <221> NAME/KEY: transit_peptide
22 <222> LOCATION: (1179)..(1347)
23 <220> FEATURE:
24 <221> NAME/KEY: CDS
25 <222> LOCATION: (1179)..(2217)
26 <220> FEATURE:
27 <221> NAME/KEY: terminator
28 <222> LOCATION: (2273)..(2536)
29 <400> SEQUENCE: 1
30 aagctttctt catcggtat tgattcctt aaagacttat gtttcttata ttgcttcgt 60
31 ggcgaatgt caggtaaccat ttaccactta tatttggac ttctcgactg catccctatt 120
32 ttcccaacat tttaaaatcc actatggct gaatgttgtt tcttggagaa agaaatccc 180
33 cagatggcag aaatgtatca accaatgtatc atataaaaaat gtacccttg ttctcaaaa 240
34 atctatcgga tggttccatt tgcttgcata tccaaatgtt gactacttta tattttccac 300
35 tcctctttat tactttttt atggagggtt gccatgtaca ttatattgtt aagggtttttc 360
36 gctatggat gtttttttc aattttttt atttttagaca tgggtttagat atgtgtttta 420
37 gagttgggtt gaatggatata tacgttcaag tgaagtggca tacgggttc gatgtttttt 480
38 gaccttacca tttttggacaa atatgttttac tttttgtatc agatgttttttacat 540
39 aactcaatttt caggatgtatc gtatccatcc acataaaaaat taaacccgcg tgcaccttgc 600
40 tccacatcc aagtattttc aaaccgttgct gtcctatcc accgggtgtt aacaaggccgaa 660
41 ttccgaatttt ggaatgtttt gactcaattt ccattttat attcggatgtt actaaatccaa 720
42 cttaaacttc tataattttctt attaaagtcc caattttatcc tcccaaggcc acatccctca 780
43 aatattatag actctcatcc ctttttaaacaa caacttagta aacgtttttt tttttttttt 840
44 tataaaggta ttatgttttttac aaaaatgtatc tcaatggatc catggcccaaa 900

RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/070,412

DATE: 07/18/2002

TIME: 21:58:57

Input Set : N:\Crf3\07152002\J070412.raw
 Output Set: N:\Crf3\07182002\J070412.raw

```

45 acat tagctca cacgttacac ataga catgca gcccgggaga attgttttc ttgc cactt 960
46 gtca ctccct tcaa acacct aag agt ctctcacagc acacacatac aatc acatgc 1020
47 gtcatgcat tattacacgt gateccatg caaa tcttctt ttatagccct taatattact 1080
48 cattccgttc actctttactt caaacaaaaa ctcatcaata caaa caa agat taaa aacata 1140
49 cacaggatc ctc agt caca caa aga agt aa aca atg gtc tct atg 1194
50 Met Ala Ser Ser Met
51 1 5
52 ctc tct tcc gct act atg gtt gcc tct ccg gct cag gcc act atg gtc 1242
53 Leu Ser Ser Ala Thr Met Val Ala Ser Pro Ala Gln Ala Thr Met Val
54 10 15 20
55 gct cct ttc aac gga ctt aag tcc tcc gct gcc ttc cca gcc acc cgc 1290
56 Ala Pro Phe Asn Gly Leu Lys Ser Ser Ala Ala Phe Pro Ala Thr Arg
57 25 30 35
58 aag gct aac aac gac att act tcc atc aca agc aac ggc gga cgc gtt 1338
59 Lys Ala Asn Asn Asp Ile Thr Ser Ile Thr Ser Asn Gly Gly Arg Val
60 40 45 50
61 aac tgc atg tct aga atg cca tcc gag tgc tca gac gca gct cgt cct 1386
62 Asn Cys Met Ser Arg Met Pro Ser Glu Ser Ser Asp Ala Ala Arg Pro
63 55 60 65
64 gcg cta aag cac gcc tac aaa cct cca gca tet gac gcc aag ggc atc 1434
65 Ala Leu Lys His Ala Tyr Lys Pro Pro Ala Ser Asp Ala Lys Gly Ile
66 70 75 80 85
67 acg atg gcg ctg acc atc att ggc acc tgg acc gca gtg ttt tta cac 1482
68 Thr Met Ala Leu Thr Ile Ile Gly Thr Trp Thr Ala Val Phe Leu His
69 90 95 100
70 gca ata ttt caa atc agg cta ccg aca tcc atg gac cag ctt cac tgg 1530
71 Ala Ile Phe Gln Ile Arg Leu Pro Thr Ser Met Asp Gln Leu His Trp
72 105 110 115
73 ttg cct gtg tcc gaa gcc aca gcc cag ctt ttg ggc gga agc agc agc 1578
74 Leu Pro Val Ser Glu Ala Thr Ala Gln Leu Leu Gly Gly Ser Ser Ser
75 120 125 130
76 cta ctg cac atc gct gca gtc ttc att gta ctt gag ttc ctg tac act 1626
77 Leu Leu His Ile Ala Ala Val Phe Ile Val Leu Glu Phe Leu Tyr Thr
78 135 140 145
79 ggt cta ttc atc acc aca cat gac gca atg cat ggc acc ata gct ttt 1674
80 Gly Leu Phe Ile Thr His Asp Ala Met His Gly Thr Ile Ala Leu
81 150 155 160 165
82 agg cac agg cag ctc aat gat gtc ctt ggc aac atc tgc ata tca ctg 1722
83 Arg His Arg Gln Leu Asn Asp Leu Leu Gly Asn Ile Cys Ile Ser Leu
84 170 175 180
85 tac gcc tgg ttt gac tac agc atg ctg cat cgc aag cac tgg gag cac 1770
86 Tyr Ala Trp Phe Asp Tyr Ser Met Leu His Arg Lys His Trp Glu His
87 185 190 195
88 cac aac cat act ggc gaa gtg ggg aaa gac cct gac ttc cac aag gga 1818
89 His Asn His Thr Gly Glu Val Gly Lys Asp Pro Asp Phe His Lys Gly
90 200 205 210
91 aat ccc ggc ctt gtc ccc tgg ttc gcc agc atc tgc atg tcc agc tac atg 1866
92 Asn Pro Gly Leu Val Pro Trp Phe Ala Ser Phe Met Ser Ser Tyr Met
93 215 220 225

```

RAW SEQUENCE LISTING DATE: 07/18/2002
 PATENT APPLICATION: US/10/070,412 TIME: 21:58:57

Input Set : N:\CrF3\07152002\J070412.raw
 Output Set: N:\CRF3\07182002\J070412.raw

94	tcc ctg tgg cag ttt gcc cgg ctg gca tgg tgg gca gtg gtg atg caa	1914
95	Ser Leu Trp Gln Phe Ala Arg Leu Ala Trp Trp Ala Val Val Met Gln	
96	230 235 240 245	
97	atg ctg ggg gcg ccc atg gca aat ctc cta gtc ttc atg gct gca gcc	1962
98	Met Leu Gly Ala Pro Met Ala Asn Leu Leu Val Phe Met Ala Ala Ala	
99	250 255 260	
100	cca atc ttg tca gca ttc cgc ctc ttc tac ttc ggc act tac ctc cca	2010
101	Pro Ile Leu Ser Ala Phe Arg Leu Phe Tyr Phe Gly Thr Tyr Leu Pro	
102	265 270 275	
103	cac aag cct gag cca ggc cct gca gca ggc tct cag gtg atg gct gcc tgg	2058
104	His Lys Pro Glu Pro Gly Pro Ala Ala Gly Ser Gln Val Met Ala Trp	
105	280 285 290	
106	ttc agg gcc aag aca agt gag gca tct gat gtg atg agt ttc ctg aca	2106
107	Phe Arg Ala Lys Thr Ser Glu Ala Ser Asp Val Met Ser Phe Leu Thr	
108	295 300 305	
109	tgc tac cac ttt gac ctg cac tgg gag cac cac aga tgg ccc ttt gcc	2154
110	Cys Tyr His Phe Asp Leu His Trp Glu His His Arg Trp Pro Phe Ala	
111	310 315 320 325	
112	ccc tgg tgg cag ctg ccc cac tgc cgc cgc ctg tcc ggg cgt ggc ctg	2202
113	Pro Trp Trp Gln Leu Pro His Cys Arg Arg Leu Ser Gly Arg Gly Leu	
114	330 335 340	
115	gtg cct gcc tgg gca tgacctggc ctcgcgtgg tgaccceggcgtctgcacaag	2257
116	Val Pro Ala Leu Ala	
117	345	
118	agtgtcatgg agtctgaatttcccgatcg ttcaaacatt tggcaataaa gtttcttaag	2317
119	attgttaatcccttggccggtc ttgcgatgtatcatataa ttctgttga attacgttaa	2377
120	gcatgttaataatcacatgtt atatgcgtac ttatgtttagt agatgggtttt ttatgttag	2437
121	agtcccgcaa ttatcacatttt aatacgcgtt agaaaaacaaa atatacgccg caaacttagga	2497
122	taaattatcg ccgcgggtt catctatgtt actatgcgtt gaattc	2543
124	<210> SEQ ID NO: 2	
125	<211> LENGTH: 346	
126	<212> TYPE: PRT	
127	<213> ORGANISM: Artificial Sequence	
128	<220> FEATURE:	
129	<223> OTHER INFORMATION: Description of Artificial Sequence: deduced fusion protein of transit peptide + peptide with beta-carotene C-4 oxygenase activity	
130	<400> SEQUENCE: 2	
131	Met Ala Ser Met Leu Ser Ser Ala Thr Met Val Ala Ser Pro Ala	
132	1 5 10 15	
133	Gln Ala Thr Met Val Ala Pro Phe Asn Gly Leu Lys Ser Ser Ala Ala	
134	20 25 30	
135	Phe Pro Ala Thr Arg Lys Ala Asn Asn Asp Ile Thr Ser Ile Thr Ser	
136	35 40 45	
137	Asn Gly Gly Arg Val Asn Cys Met Ser Arg Met Pro Ser Glu Ser Ser	
138	50 55 60	
139	Asp Ala Ala Arg Pro Ala Leu Lys His Ala Tyr Lys Pro Pro Ala Ser	
140	65 70 75 80	
141	Asp Ala Lys Gly Ile Thr Met Ala Leu Thr Ile Ile Gly Thr Trp Thr	
142		
143		

RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/070,412DATE: 07/18/2002
TIME: 21:58:57Input Set : N:\Crf3\07152002\J070412.raw
Output Set: N:\CRF3\07182002\J070412.raw

144	85	90	95	
145	Ala Val Phe Leu His Ala Ile Phe Gln Ile Arg Leu Pro Thr Ser Met			
146	100	105	110	
147	Asp Gln Leu His Trp Leu Pro Val Ser Glu Ala Thr Ala Gln Leu Leu			
148	115	120	125	
149	Gly Gly Ser Ser Ser Leu Leu His Ile Ala Ala Val Phe Ile Val Leu			
150	130	135	140	
151	Glu Phe Leu Tyr Thr Gly Leu Phe Ile Thr Thr His Asp Ala Met His			
152	150	155	160	
153	Gly Thr Ile Ala Leu Arg His Arg Gln Leu Asn Asp Leu Leu Gly Asn			
154	165	170	175	
155	Ile Cys Ile Ser Leu Tyr Ala Trp Phe Asp Tyr Ser Met Leu His Arg			
156	180	185	190	
157	Lys His Trp Glu His His Asn His Thr Gly Glu Val Gly Lys Asp Pro			
158	195	200	205	
159	Asp Phe His Lys Gly Asn Pro Gly Leu Val Pro Trp Phe Ala Ser Phe			
160	210	215	220	
161	Met Ser Ser Tyr Met Ser Leu Trp Gln Phe Ala Arg Leu Ala Trp Trp			
162	225	230	235	240
163	Ala Val Val Met Gln Met Leu Gly Ala Pro Met Ala Asn Leu Leu Val			
164	245	250	255	
165	Phe Met Ala Ala Ala Pro Ile Leu Ser Ala Phe Arg Leu Phe Tyr Phe			
166	260	265	270	
167	Gly Thr Tyr Leu Pro His Lys Pro Glu Pro Gly Pro Ala Ala Gly Ser			
168	275	280	285	
169	Gln Val Met Ala Trp Phe Arg Ala Lys Thr Ser Glu Ala Ser Asp Val			
170	290	295	300	
171	Met Ser Phe Leu Thr Cys Tyr His Phe Asp Leu His Trp Glu His His			
172	305	310	315	320
173	Arg Trp Pro Phe Ala Pro Trp Trp Gln Leu Pro His Cys Arg Arg Leu			
174	325	330	335	
175	Ser Gly Arg Gly Leu Val Pro Ala Leu Ala			
176	340	345		

VERIFICATION SUMMARY DATE: 07/18/2002
PATENT APPLICATION: US/10/070,412 TIME: 21:58:58

Input Set : N:\Crf3\07152002\J070412.raw
Output Set: N:\CRF3\07182002\J070412.raw